

component (F), an accelerator is preferably used for accelerating the reaction of the epoxy resin with the carboxyl groups in the component of (A), (B) and (D). The accelerator for curing the epoxy resin includes an imidazole compound such as 2-methylimidazole, 2-ethyl-3-methylimidazole, 2-undecylimidazole, 2-phenylimidazole, 1-cyanoethyl-2-ethylimidazole and 1-cyanoethyl-2-undecylimidazole; a triazine derivative such as melamine, guanamine, acetoguanamine, benzoguanamine, ethyldiaminotriazine, 2,4-diaminotriazine, 2,4-diamino-6-tolyltriazine and 2,4-diamino-6-xylyltriazine; an amine such as dicyandiamide, trimethylamine, triethanolamine, N,N-dimethyloctylamine, pyridine and m-aminophenol; and a polyphenol. These curing accelerators may be used alone or in their combination.

The above component (F) is preferably mixed in a resin composition immediately before applying to a printed circuit board, though it may be mixed beforehand. The procedure is as follows. An accelerator for curing the epoxy resin is incorporated in the components of (A) to (E) for the main part to prepare a primary resin composition solution. On the other hand, the component of (F) is used for a main part to prepare a curing agent composition. The two liquid type of solutions are preferably mixed just before applying. The curing agent

composition containing the component (F) is preferably liquid. The component (F) may be beforehand diluted with the above non-reactive diluent (c-2) if necessary. The component (F), if it is solid, is preferably diluted into a liquid. The non-reactive diluent is about 0-50%, preferably about 0-40% in amount relative to the total amount of the curing agent composition containing the component of (F). The remainder is the component of (F).

Various kinds of additives may be added to the resin composition of the present invention to improve the properties if necessary. The additives include a filler such as talc, barium sulfate, calcium carbonate, magnesium carbonate, barium titanate, aluminum hydroxide, aluminum oxide, silica, and clay; a thixotrope agent such as aerosil; a pigment and a dyestuff such as phthalocyanine blue, phthalocyanine green, and titanium oxide; silicone; a fluoride type leveling agent or an anti-forming agent; a polymerization inhibitor such as hydroquinone and hydroquinone monomethyl ether; a coupling agent; a plasticizer; a mold lubricant; an antioxidant; a light stabilizer; and a wax.

The above components of (A) to (F) can be combined in an optional rate to use in the present invention. The preferable combinations are described below for representative examples.

The first combination:

The urethane oligomer (A) and/or the water-soluble urethane oligomer (A'), the reactive diluent (C-1) and the photopolymerization initiator(E).

The second combination:

The urethane oligomer (A), the unsaturated group-containing polycarboxylic acid resin (B), the diluent (C), the photopolymerization initiator(E) and the thermosetting component (F).

The third combination:

The urethane oligomer (A), the diluent (C), the photopolymerization initiator(E) and the thermosetting component (F).

The fourth combination:

The urethane oligomer (A), the diluent (C), the thermoplastic polymer (D), the photopolymerization initiator(E) and the thermosetting component (F).

Each rate relative to the total mass of the composition of the components used in the first composition is as follows:

- (1) The rate of the urethane oligomer (A) and/or the water-soluble urethane oligomer (A') are 10% by mass (same hereinafter, unless otherwise stated) or more, preferably 30% or more, more preferably 50% or more, and 97% or less, more preferably 90% or less.